#5 / Request for Reconsid 11/8/02 JS

Docket No.: 50090-306

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of	:	
Hiroshi TOBIMATSU, et al.	:	
Serial No.: 09/910,824	:	Group Art Unit: 2823
Filed: July 24, 2001	:	Examiner: H. Lee

For: METHOD OF MANUFACTURING SEMICONDUCTOR DEVICE HAVING PASSIVATION FILM AND BUFFER COATING FILM

REQUEST FOR RECONSIDERATION

Commissioner for Patents
Washington, DC 20231

Sir:

Reconsideration of the rejection under 35 U.S.C. §103 imposed in the Office Action dated August 2, 2002 is respectfully solicited in light of the following Remarks.

REMARKS

Claims 1 through 6 were rejected under 35 U.S.C. §103 for obviousness predicated upon Shinohara in view of Sakurai and Fu et al.

In the statement of the rejection the Examiner **admitted** that Shinohara does not disclose the formation or removal of a hardened layer on the surface of the polyimide film. Nevertheless, the Examiner concluded that the claimed invention would have been obvious. This rejection is traversed as factually and legally erroneous.

The imposed rejection is fatally flawed because of the **admitted** and conspicuous **absence** in the applied prior art of any **recognition** of forming a hardened layer on the surface of a polyimide film, let alone ashing to remove that polyimide film. **It is a fundamental tenet that obviousness can not be predicated upon that which is unknown.** *In re Shetty, 566 F.2d 81, 195 USPQ 753 (CCPA 1977).*

Specifically, Shinohara neither discloses nor suggests the formation of a hardened polyimide layer. That much is **admitted by** the Examiner. The Examiner notes that Shinohara discloses oxygen ashing. However, Shinohara conducts oxygen ashing under **conditions to remove fluorine ions** used for etching which are left on the surface of the polyimide film. There is **no disclosure** of or any suggestion to remove an **unknown** hardened polyimide layer as in the present invention.

The additional references are of no avail. Specifically, Sakurai discloses a hardened photoresist layer--**not a hardened polyimide layer**. Sakurai's disclosure with respect to oxygen ashing for removing a hardened **photoresist layer is not relevant to removing a polyimide layer**. Indeed, the Examiner has failed to provide any **objective evidence** upon which to predicate the conclusion that one having ordinary skill in the art would have been realistically motivated to remove an **unknown** hardened layer on the **polyimide** film disclosed by Shinohara et al. based upon the disclosure of Sakurai et al. with respect to removing a hardened **photoresist** layer. *In re Lee, 237 F.3d 1338, 61 USPQ2d 1430, 1433 (Fed. Cir. 2002).* Applicants would further submit that Sakurai can not achieve dimensional accuracy because the polyimide film is hardened by prebaking prior to etching the silicon nitride.

The mere disclosure of a photosensitive polyimide film by Fu et al. would **not** have rendered the claimed invention **as a whole** obvious within the meaning of 35 U.S.C. §103. Indeed, Fu et al. neither disclose nor suggest the formation of a **hardened layer** on a polyimide film. The entire rejection is improperly predicated upon information garnered from Applicants' disclosure. As the Examiner should be aware, Applicants' disclosure is forbidden territory upon which the Examiner may excavate for the requisite motivational element. *Panduit Corp. v. Dennison Mfg. Co., 810 F.2d 1561, 227 1 USPQ2d 1593 (Fed. Cir. 1987).*

The Examiner's rejection is apparently predicated upon inherency. Applicants submit that the Examiner's reliance upon inherency is factually and legally erroneous for reasons set forth hereinafter.

There is no inherency.

As mentioned above, the Examiner **admits** that Shinohara does not disclose a method comprising the formation of a hardened layer on a polyimide film due to etching the underlying passivation film, or the manipulative step of removing the hardened layer. The Examiner resorts to inherency. Applicants disagree that the present situation justifies invoking the doctrine of inherency.

In order to rely upon the doctrine of inherency, it is incumbent upon the Examiner to provide a factual basis upon which to predicate the determination that the allegedly inherent result **necessarily** flows from the teachings of the applied prior art, **and** that one having ordinary skill in the art would have **recognized** such a necessary result. *Crown Operations International, Ltd. v. Solutia, Inc., ___F.3d___, 62 USPQ2d 1917 (Fed. Cir.*

2002); Finnegan Corp. v. ITC, 180 F.3d 1354, 51 USPQ2d 1001 (Fed. Cir. 1999); In re Robertson, 169 F.3d 743, 49 USPQ2d 1949 (Fed. Cir. 1999).

The Examiner, as apparent from page 5 of the August 2, 2002 Office Action, lines 10 et. sec., implicitly acknowledges the above legal tenet requiring certainty and art recognition. However, the Examiner's attempt to establish the requisite certainty and art recognition does not withstand scrutiny.

Firstly, the Examiner **assumes** that a hardened polyimide layer is formed in the methodology of Shinohara. There is **no** factual basis upon which to predicate the conclusion that a hardened layer is **necessarily** formed employing the particular etching technique of Shinohara. As disclosed on page 5 of the written description of the specification, line 34 through page 6, line 5, whether or not a hardened polyimide layer is formed depends upon the **etching conditions** of the passivation film. The Examiner has **not** provided the requisite **factual** basis upon which to predicate the conclusion that Shinohara's process happens to involve the right etching conditions to generate a hardened polyimide layer.

Indeed, Shinohara addresses a **different problem** from that addressed by the claimed invention. Shinohara is concerned with a problem attendant upon oxygen ashing which disassociates the imide coupling thereby reducing adhesion of the polyimide to the mold resin. On the other hand, the present invention is primarily concerned with dimensional accuracy and, in order to achieve that objective, forms an **undesirable** hard polyimide film which is then **purposely removed** by oxygen ashing. Oxygen ashing is employed by Shinohara is for the purpose of **reducing fluorine** contaminants.

Thus, in order to arrive to establish the requisite **certainty**, it must first be established that the methodology disclosed by Shinohara **necessarily** results in the formation of a hardened polyimide film. Then it must also be established that the oxygen ashing technique disclosed by Shinohara necessarily removes of the upper surface of the polyimide film thereby insuring removal of the hardened polyimide film which is **not mentioned by Shinohara**. The **fortuitous** selection of the right passivation etching techniques and the **fortuitous** selection of the right oxygen ashing conditions **undermine** the requisite **certainty**. *Electro Medical Systems S.A. v. Cooper Life Sciences, Inc., 34 F.3d 1048, 32 USPQ2d 1017 (Fed. Cir. 1994); Continental Can Co. USA, Inc. v. Monsanto Co., 948 F.2d 1264, 20 USPQ2d 1746 (Fed. Cir. 1991); In re Oelrich, 666 F.2d 578, 212 USPQ 323 (CCPA 1981).* **Thus, the Examiner's inherency theory lacks the requisite certainty.**

As pointed out above, the Examiner recognizes the legal requirement for **art recognition** of an inherent result. In attempting to establish art recognition, the Examiner states that Shinohara employs an ashing process. The questions which arise are: (1) under what conditions does Shinohara employ oxygen ashing? and (2) how much of the upper surface of the polyimide layer is removed, **assuming** that a hardened layer is formed to begin with by virtue of the disclosed etching technique of the passivation film?

The Examiner attempts to substantiate art recognition by referring to column 2 of Sakurai, lines 41 through 49. **Suffice to say, Sakurai does not disclose the use of a photoresist polyimide film.**

The Examiner then attempts to buttress the art recognition element by referring to column 5 of Fu et al., lines 39 and 40. **However, Fu et al. neither disclose nor suggest the formation of a hardened film on a photosensitive polyimide film.**

Applicants appreciate the Examiner's knowledge as to the applicable legal principles of inherency which requires certainty and art recognition. Applicants also appreciate the Examiner's attempt to satisfy such legal requirements for certainty and art recognition. Applicants, however, disagree with the Examiner that the present factual situation supports the doctrine of inherency. This is because of the **uncertainty** involved in selecting the appropriate etching conditions for the passivation layer to form a hardened polyimide layer and in selecting the appropriate conditions for ashing, including the period of time during which ashing is conducted, to ensure removal of an **unknown** hardened layer from the upper surface of the polyimide layer.

In treating claim 5, the Examiner concludes that one having ordinary skill in the art would have determined the optimum amount of polyimide to remove by routine experimentation. The problem with this approach is that the prior art neither discloses nor suggests that the amount of polyimide removal during oxygen ashing is a result effective variable which lends itself to optimization in the first place. See *In re Rijckaert, 9 F.3d 1531, 28 USPQ2d 1955 (Fed. Cir. 1993); In re Yates, 663 F.2d 1054, 211 USPQ 1149 (CCPA 1981); In re Antonie, 559 F.2d 618, 195 USPQ 6 (CCPA 1977).* Again, the prior art neither discloses nor suggests the formation of a hardened layer on the upper surface of the polyimide film. Ergo, it can not be concluded that one having ordinary skill in the art would have purposely adjusted the oxygen ashing step in order to ensure

removal of such a hardened polyimide film or any particular amount of the polyimide film.

Applicants would refer to the decision in *Ex parte Schricker, 56 USPQ2d 1723, 1725 (BPAI 2000),* wherein the Honorable Board of Patent Appeals and Interferences stated:

> Inherency and obviousness are somewhat like oil and water-they do not mix well.

As pointed out above, the applied prior art neither discloses nor suggest the formation of a hardened polyimide layer on the upper surface of a photoresist polyimide film. This being the case, it can not be said that one having ordinary skill in the art would have been realistically motivated to remove an **unknown hardened layer**. That which is unknown can not be obvious. *In re Rijckaert, supra; In re Shetty, 566 F.2d 81, 195 USPQ 753 (CCPA 1977); In re Newell, 891 F.2d 899, 13 USPQ2d 1248 (Fed. Cir. 1989); In re Spormann, 363 F.2d 444, 150 USPQ 449 (CCPA 1966).*

Moreover, it is well settled that the **problem** addressed and solved by a claimed invention must be given consideration in resolving the ultimate legal conclusion of obviousness under 35 U.S.C. §103. *North American Vaccine, Inc. v. American Cyanamid Co., 7 F.3d 1571, 28 USPQ2d 1333 (Fed. Cir. 1993); Northern Telecom, Inc. v. Datapoint Corp., 908 F.2d 931, 15 USPQ2d 1321 (Fed. Cir. 1990); In re Newell, 891 F.2d 899, 13 USPQ2d 1248 (Fed. Cir. 1989).* The present invention addresses and solves the problem of wrinkle generation during curing. Applicants **recognize** that the problem is caused by the formation of a hardened polyimide layer during etching. The applied prior art does not recognize that problem. It is well settled that the recognition of a

source of a problem is indicium of **nonobviousness** in itself. *In re Sponnoble, 405 F.2d 578, 160 USPQ 237 (CCPA 1969).*

Applicants solve the problem by strategically conducting ashing to remove the hardened polyimide layer. As admitted by the Examiner, the applied prior art does **not** even recognize the formation of a hardened polyimide layer. How then can the claimed invention be obvious? *In re Shetty, supra.*

Conclusion

Based upon the foregoing, Applicants submit that a prima facie basis to deny patentability to the claimed under 35 U.S.C. §103 has not been established. Applicants submit that the Examiner's attempt to invoke the doctrine of inherency is misplaced. *Crown Operations International Ltd. v. Solutia Inc., supra; Finnegan Corp. v. ITC, supra; In re Robertson, supra.* Moreover, upon giving due consideration to the problem addressed and solved by the claimed invention, and Applicants' recognition of the source of the problem, the conclusion appears inescapable that one having ordinary skill in the art would **not** have found the claimed invention **as a whole** obvious within the meaning of 35 U.S.C. §103. *In re Piasecki, 745 F.2d 1468, 223 USPQ 785 (Fed. Cir. 1984).*

Applicants, therefore, submit that the imposed rejection of claims 1 through 6 under 35 U.S.C. §103 for obviousness predicated upon Shinohara in view of Sakurai and Fu et al. is not factually or legally viable and, hence, solicit withdrawal thereof.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this

paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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